REMARKS

Before entry of this Amendment, claims 1 to 17 are pending. In this Amendment, claims 2 and 8 are canceled. Thus, after entry of this Amendment, claims 1, 3-7, and 9-17 will be pending. Reconsideration and continued examination of this application is respectfully requested in view of the amendments above and the remarks that follow.

Claim Objections

The Office Action objected to claims 2 and 8 because they recite limitations included in parent claim 1. In response, those claims have been canceled.

§ 103 Rejections

The Office Action rejected claims 1, 2, 5, 6, 8, 9 and 15-17 under 35 USC § 103(a) as being unpatentable over U.S. Patent 6,155,699 (Miller et al.) in view of U.S. Patent 5,540,978 (Schrenk). The Office Action reasoned that it would have been obvious "for Miller to use polymeric materials suitable for multilayer reflectors in visible and UV applications, as taught by Schrenk, in order to improve the cost efficiency, weight and longevity of the light source, as taught by Schrenk and as is known in the art." With respect to longevity, the Office Action reasoned that the use of polymers "provid[es] better thermal expansion property matching with Miller's epoxies and resins (28 and 22) such that flaws due to thermal fatigue are minimized for improved longevity of the device." Applicants respectfully submit that this rejection, steeped in improper hindsight, cannot be sustained.

Cost. As mentioned in Applicants' response of 24 July 2006, many different factors influence the net cost of a component. The Examiner asserts categorically, or interprets Schrenk to teach, that the use of polymers "provides a cheaper device, both in raw material cost and manufacturing cost." Schrenk does not contain such a categorical teaching. A careful reading of Schrenk reveals that the cost advantage referred to therein is related to the large surface area of the chief contemplated application:

> "Multilayer metal oxide coatings require repetitive layer depositions using sputtering or chemical vapor deposition techniques. The costs to produce

multilayer metal oxide films are presently prohibitive for the large surface areas needed for solar detoxification reflectors."

Schrenk at col. 2 lines 10-12. The person of ordinary skill would understand that since sputtering and chemical vapor deposition techniques generally require a controlled chamber, such as a vacuum chamber, in which to form the multilayer coating, the system cost to coat large surface area objects (such as the solar detoxification reflectors depicted in Schrenk's FIG. 2) with metal oxide coatings is prohibitively expensive. The person of ordinary skill would have no reason to believe that the same economic constraints would also apply to the comparatively miniscule distributed Bragg reflector (DBR) mirror of Miller, whose size is on the order of an LED die and easily compatible with the smallest of sputtering or CVD systems. Moreover, the Examiner mentions manufacturing costs, but ignores costs associated with additional manufacturing steps that would be needed if the sputtered metal oxide film were replaced with Schrenk's polymer film, such as (1) cutting, (2) shaping, and (3) reliably attaching the polymer film to the dome-shaped structure (encapsulating layer 28) that encapsulates Miller's GaN die 12. Such steps are avoided with Miller's sputtered or CVD-applied metal oxide films.

Weight. The Office Action alleges the use of an all-polymeric multilayer film would decrease the weight of Miller's device. This however ignores the fact that weight is a function of not only material density but material thickness (volume). The much smaller refractive index difference between Schrenk's polyvinylidene fluoride/polymethyl methacrylate polymers (on the order of 0.07, see col. 10 lines 12-15 of Schrenk) compared to Miller's SiO_2/TiO_2 oxides means that many more layer pairs of the polymers are required to achieve the same reflectivity as a given number of layer pairs of the oxides. Note, for illustrative purposes, Miller's reference to five layer pairs of the oxides (col. 8 lines 20-22 of Miller) and Schrenk's reference to 100, 200, 400, 650, and 1300 alternating layers of the polymers (col. 10 lines 16-18 and FIG. 3 of Schrenk). Since a greater number of layers of the polymers would be needed to achieve a given desired reflectivity, there is no support for the proposition that an all-polymeric multilayer film would decrease the weight of Miller's device.

Longevity. The Office Action alleges the use of an all-polymeric multilayer film would improve the longevity of Miller's device by reducing fatigue due to better thermal expansion property matching. However, this ignores the fact that the dome-shaped structure (encapsulating

layer 28) of Miller can be epoxy or glass. See col. 5 lines 25-26 of Miller. It is not apparent how Schrenk's polymer materials would better match the properties of glass.

From the foregoing it can be seen that the rationale suggested in the Office Action for combining Schrenk with Miller cannot be sustained. At least for this reason, the rejection of claim 1 and its dependent claims 2, 5, 6, 8, 9 and 15-17 cannot be sustained and should be withdrawn.

Provisional Obviousness-Type Double Patenting Rejections

The Office Action provisionally rejected claims 1-17 over various claims of copending and commonly assigned U.S. Application 10/726,995 (Attorney Docket No. 59415US002), in view of U.S. Patent 6,155,699 (Miller), under the judicially-created doctrine of obviousness-type double patenting ("ODP"). The present claims 1-17 were also provisionally rejected over various claims of copending and commonly assigned U.S. Application 10/726,790 (Attorney Docket No. 59414US002), under the same legal doctrine.

In response, Applicants submit terminal disclaimers over those patent applications. The rejection should therefore be withdrawn.

CONCLUSION

In view of the foregoing, the present application is submitted to be in condition for allowance, the early indication of which is earnestly solicited.

Respectfully submitted,

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